

1.4

Using Different Data Types

At a Glance

PACING 1 day

Mathematical Goals

- Identify whether data are categorical or numerical
- Use bar graphs to display data distributions
- Understand how median, mode, and range relate to numerical and categorical data

Launch

Refer students to the Getting Ready. Use Transparency 1.4A. Have a brief discussion about numerical and categorical data. Consider asking:

- *Which questions have words or categories as answers?*
- *Which questions have numbers as answers?*

To help students summarize the distinction between categorical and numerical data, and to launch the next part of the problem ask:

- *What other kinds of questions can you ask about pets that would give either categorical or numerical answers?*

Read the rest of the problem aloud with the students. Look at the pet data (without the graphs), and have students discuss these questions in pairs: “What is your favorite kind of pet?” and “How many pets do you have?”

Launch the problem in two stages. In the first stage, help your students understand why they cannot find the median or range of categorical data. Have students work with their books closed. Then show Transparencies 1.4B and 1.4C. Work with students to make sure they can read the two tables and understand the data as they are presented. Discuss how to read the graphs. Ask:

- *How many students chose a dog as their favorite pet?*
- *How many students have 6 pets?*
- *How many total students chose dogs or cats as their favorite pets?*
- *What do you know about how many pets each of these students has?*

Let students work in pairs or small groups.

Materials

- Transparencies 1.4A–C

Vocabulary

- categorical data
- numerical data

Explore

Some students may struggle with Questions C, E, G, or I. For Question C, students need to understand that the height of each bar indicates how many students have that number of pets. For Question E help students find out how many students are in the class using either graph. For Question G, students may need help in understanding that the number of students who chose a favorite pet does not represent the number of students who have the pet. For Question I, you could ask students who are struggling with locating the median from the graph:

- *How do we find the median?*
- *How can you do this using the graph?*

Summarize

Have a class discussion in which teams of students explain their responses to the questions. It is important for students to understand what they can and cannot know from a set of data. To complete this activity, you may want students to work in pairs for about five minutes, to write some questions about these data that can and cannot be answered, and to discuss what information may be needed to answer them.

Materials

- Student notebooks

ACE Assignment Guide for Problem 1.4



Core 14–20, 31

Other *Connections* 32, *Extensions* 40–43;
unassigned choices from previous problems

Adapted For suggestions about adapting ACE exercises, see the *CMP Special Needs Handbook*.

Answers to Problem 1.4

- A. The graph of favorite kinds of pets shows categorical data.
- B. The graph of number of pets shows numerical data.
- C. 156 pets (multiply each number of pets by its frequency, then add the results)
- D. 21 pets (this is the highest number with a bar on top of it on the horizontal axis of the “Number of Pets” graph)
- E. 26 students (add the frequency for each favorite kind of pet on the graph or add the frequency for each number of pets on the graph)
- F. 4 students
- G. This question cannot be answered from the data given.
- H. dog
- I. $3\frac{1}{2}$ pets
- J. The range is 21.
- K. This question cannot be answered from the data. Data by individual students were not collected.
- L. This question cannot be answered from the data. Data by gender were not collected.